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CONESUS LAKE, LIVINGSTON COUNTY, NEW YORK

Pacific Northwest Environmental Research Laboratory

Prepared for:

National Environmental Research Center, Corvallis
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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT

ON

CONESUS LAKE

LIVINGSTON COUNTY

NEW YORK

EPA REGION II

WORKING PAPER No. 156

WITH THE COOPERATION OF THE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AND THE

NEW YORK NATIONAL GUARD

DECEMBER, 1974

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the New York Department of Environmental Conservation for professional involvement and to the New York National Guard for conducting the tributary sampling phase of the Survey.

Henry L. Diamond, Commissioner of the New York Department of Environmental Conservation, and Leo J. Hetling, Director, and Italo G. Carcich, Senior Sanitary Engineer, Environmental Quality Research, Department of Environmental Conservation, provided invaluable lake documentation and counsel during the Survey.

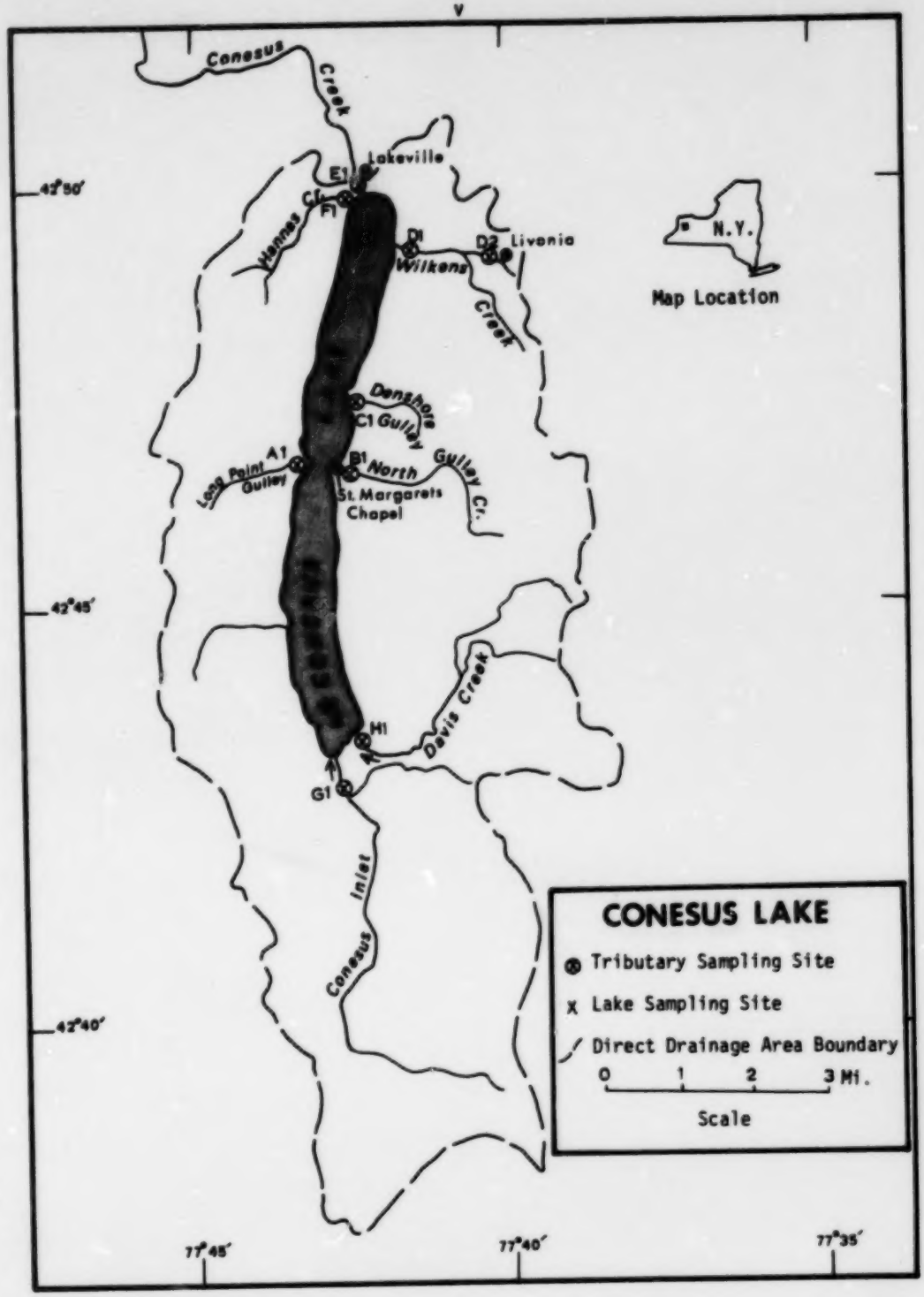
Major General John C. Baker, the Adjutant General of New York, and Project Officer Lieutenant Colonel Fred Peters, who directed the volunteer efforts of the New York National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF NEW YORK

LAKE NAME	COUNTY
Allegheny Reservoir	Cattaraugas, NY; McLean, Warren, PA
Black	St. Lawrence
Canadaigua	Ontario
Cannonsville	Delaware
Carry Falls	St. Lawrence
Cassadaga	Chautauqua
Cayuga	Seneca, Tompkins
Champlain	Clinton, Essex, NY; Addison, Chittenden, Franklin, VT
Chautauqua	Chautauqua
Conesus	Livingston
Cross	Cayuga, Onondaga
Goodyear	Otsego
Huntington	Sullivan
Keuka	Ontario
Long	Hamilton
Lower St. Regis	Franklin
Otter	Cayuga
Owasco	Cayuga
Raquette Pond	Franklin
Round	Saratoga
Sacandaga Res.	Fulton, Saratoga
Saratoga	Saratoga
Schroon	Essex, Warren
Seneca	Seneca, Schyler, Yates
Swan	Sullivan
Swinging Bridge Res.	Sullivan


Conesus Creek
Lakeville
E1
F1
Hannas Cr.
D1
D2
Livonia
Wilkens Creek
Map Location
N.Y.
Denshore
C1 Gulley
A1
Long Point Gulley
B1
North Gulley Cr.
St. Margarets Chapel
42°50'
42°45'
42°40'
H1
Davis Creek
G1
Conesus Inlet
77°45'
77°40'
77°35'
CONESUS LAKE
Tributary Sampling Site
Lake Sampling Site
Direct Drainage Area Boundary
0 1 2 3 Mi.
Scale

CONESUS LAKE

STORET NO. 3639

I. CONCLUSIONS

A. Trophic Condition:

Survey data and the records of others (Ketelle and Uttormark, 1971) show that Conesus Lake is eutrophic. Of the 26 New York lakes sampled in the fall of 1972, when essentially all were well-mixed, 11 had less mean total phosphorus, 21 had less mean dissolved phosphorus, and three had less mean inorganic nitrogen. For all New York data, 15 had less mean chlorophyll a and 6 had greater Secchi disc transparency.

Depression of dissolved oxygen with depth occurred at both sampling stations in July, and Survey limnologists also noted an algal bloom in progress at that time.

B. Rate-Limiting Nutrient:

A significant loss of nutrients occurred in the algal assay sample between the time of collection and the beginning of the assay, and the results are not indicative of lake conditions. However, the lake data indicate that nitrogen was limiting during the May and October samplings (N/P ratios were less than 8/1), and phosphorus was limiting during the July sampling when the N/P ratio was 19/1.

C. Nutrient Controllability:

1. Point sources--During the sampling year, the mean annual contribution from point sources was about 9% of the total phosphorus

load, all of which originated from septic tanks along the lakeshore. The Conesus Lake area is now served by a peripheral sewer system which has eliminated discharges that once reached the lake, and the City of Livonia has diverted its effluent out of the basin since the summer of 1973 (Oglesby, 1974). Also, the only industrial source of nutrients is now using land disposal of wastes.

The existing phosphorus loading rate of Conesus Lake is 3.2 lbs/acre/year or 0.36 g/m^2/year which is at a rate proposed by Vollenweider (in press) as a mesotrophic rate (see page 11). It is expected that the control measures recently put into practice will alleviate the eutrophic symptoms evident in Conesus Lake.

2. Non-point sources (see page 11)--The phosphorus exports of the Conesus Lake tributaries were quite high as compared to streams studied elsewhere in New York (e.g., tributaries to Canadaigua Lake*). Even so, the phosphorus export of Wilkins Creek was from two to nine times higher than the other Conesus tributaries. The high export rate and the low N/P export ratio indicate the impact of the City of Livonia which discharged to Wilkins Creek during much of the sampling year.

In all, it is estimated that non-point sources contributed about 93% of the total phosphorus reaching Conesus Lake (ignoring the contribution from Livonia during a part of the sampling year).

* Working Paper No. 149.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 3,185 acres.
2. Mean depth: 29.2 feet.
3. Maximum depth: 62 feet.
4. Volume: 93,002 acre/feet.
5. Mean hydraulic retention time: 1.7 years.

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries -

Name	Drainage area*	Mean flow*
Long Point Gulley	2.1 mi^2	2.3 cfs
North Gulley Creek	2.6 mi^2	2.9 cfs
Denshore Gulley	2.4 mi^2	2.7 cfs
Wilkins Creek	1.9 mi^2	2.2 cfs
Hannas Creek	2.7 mi^2	3.0 cfs
Conesus inlet	28.7 mi^2	31.9 cfs
Davis Creek	7.8 mi^2	8.7 cfs
Minor tributaries & immediate drainage -	16.5 mi^2	23.1 cfs
Total	64.7 mi^2	76.8 cfs

2. Outlet -

Conesus Creek	69.7 mi^2**	76.8 cfs

C. Precipitation***:

1. Year of sampling: 33.0 inches.
2. Mean annual: 31.0 inches.

† Stewart and Markello, 1974.
* Drainage areas are accurate within ±5%, except for small basins (±10%); mean daily flows are accurate within ±5 to 25%; and normalized mean monthly flows are accurate within ±15%.
** Includes area of lake.
*** See Working Paper No. 1, "Survey Methods".

III. LAKE WATER QUALITY SUMMARY

Conesus Lake was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two stations on the lake and from a number of depths at each station (see map, page v). During each visit, a single depth-integrated (15 feet or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single five-gallon depth-integrated sample was collected for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 42 feet at station 1 and 46 feet at station 2.

The results obtained are presented in full in Appendix B, and the data for the fall sampling period, when the lake was essentially well-mixed, are summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

Parameter	Minimum	Mean	Median	Maximum
		FALL VALUES (10/13/72)		
Temperature (Cent.)	14.0	14.3	14.4	14.5
Dissolved oxygen (mg/l)	7.4	8.3	8.2	9.3
Conductivity (μmhos)	330	339	340	345
pH (units)	7.9	8.1	8.1	8.4
Alkalinity (mg/l)	114	118	117	122
Total P (mg/l)	0.022	0.029	0.029	0.036
Dissolved P (mg/l)	0.012	0.021	0.023	0.029
NO_2 + NO_3 (mg/l)	0.020	0.027	0.025	0.040
Ammonia (mg/l)	0.040	0.076	0.080	0.150
		ALL VALUES		
Secchi disc (inches)	75	126	144	156

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Number per ml
05/27/72	1. Dinobryon	982
	2. Fragilaria	356
	3. Schroederia	36
	4. Cryptomonas	36
	5. Flagellates	30
	Other genera	37
	Total	1,477
07/27/72	1. Fragilaria	588
	2. Cyclotella	149
	3. Dinobryon	140
	4. Schroederia	90
	5. Cryptomonas	81
	Other genera	145
	Total	1,193
10/13/72	1. Anabaena	1,642
	2. Flagellates	407
	3. Melosira	346
	4. Dinobryon	286
	5. Melosira	271
	Other genera	482
	Total	3,434

2. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
05/27/72	01	5.8
	02	7.7
07/27/72	01	10.5
	02	5.3
10/13/72	01	3.5
	02	26.4

C. Limiting Nutrient Study:

A significant loss of nutrients occurred in the algal assay sample between the time of collection and the beginning of the assay, and the results are not indicative of conditions in the lake. However, the lake data indicate that nitrogen was limiting during the May and October samplings (N/P ratios were less than 8/1), and phosphorus was limiting during the July sampling when the N/P ratio was 19/1.

IV. NUTRIENT LOADINGS
(See Appendix C for data)

For the determination of nutrient loadings, the New York National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of April and May when two samples were collected. Sampling was begun in November, 1972, and was completed in October, 1973.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the New York District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated by using the means of the nutrient loads, in $lbs/mi^2/year$, at stations A-1, B-1, C-1, F-1, G-1, and H-1 and multiplying the means by the ZZ area in mi^2.

There are no known point sources impacting Conesus Lake.

A. Waste Sources:

1. Known municipal - None
2. Known industrial - None

* See Working Paper No. 1.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Long Point Gulley	340	3.1
North Gulley Creek	280	2.6
Denshore Gulley	250	2.3
Wilkins Creek	870	8.0
Hannas Creek	620	5.7
Conesus inlet	4,620	42.7
Davis Creek	400	3.7
b. Minor tributaries & immediate drainage (non-point load) -	2,240	20.3
c. Known municipal STP's - None	-	-
d. Septic tanks* -	740	6.8
e. Known industrial - None	-	-
f. Direct precipitation** -	500	4.8
Total	10,860	100.0

2. Outputs -

Lake outlet - Conesus Creek 4,650

3. Net annual P accumulation - 6,210 pounds

* Estimate based on 1,185 shoreline dwellings; see Working Paper No. 1.
** See Working Paper No. 1.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	lbs N/ yr	% of total
a. Tributaries (non-point load) -		
Long Point Gulley	11,200	3.8
North Gulley Creek	8,780	3.0
Denshore Gulley	10,220	3.5
Wilkins Creek	6,290	2.1
Hannas Creek	15,030	5.1
Conesus inlet	96,810	32.8
Davis Creek	20,490	6.9
b. Minor tributaries & immediate drainage (non-point load) -	67,470	22.6
c. Known municipal STP's - None	-	-
d. Septic tanks* -	27,850	9.4
e. Known industrial - None	-	-
f. Direct precipitation** -	30,680	10.8
Total	294,820	100.0

2. Outputs -

Lake outlet - Conesus Creek 162,600

3. Net annual N accumulation - 132,220 pounds

* Estimate based on 1,185 shoreline dwellings; see Working Paper No. 1.
** See Working Paper No. 1.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr	N/P Ratio
Long Point Gulley	162	5,333	33/1
North Gulley Creek	108	3,377	31/1
Denshore Gulley	104	4,258	41/1
Wilkins Creek	458	3,311	7/1
Hannas Creek	230	5,567	24/1
Conesus inlet	161	3,373	21/1
Davis Creek	51	2,627	52/1

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

	Total Phosphorus		Total Nitrogen	
Units	Total	Accumulated	Total	Accumulated
lbs/acre/yr	3.4	1.9	92.6	41.5
grams/m^2/yr	0.38	0.22	10.4	4.7

Vollenweider loading rates for phosphorus (g/m^2/yr) based on mean depth and mean hydraulic retention time of Conesus Lake:

"Dangerous" (eutrophic rate)	0.44
"Permissible" (oligotrophic rate)	0.22

V. LITERATURE REVIEWED

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Vollenweider, Richard A., (in press). Input-output models. Schweiz. A. Hydrol.

VII. APPENDICES

APPENDIX A

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR NEW YORK 11/26/74

LAKE CODE 3639 CONESUS LAKE

TOTAL DRAINAGE AREA OF LAKE 69.70

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
3639A1	2.09	2.20	3.10	6.60	6.70	3.60	1.50	0.40	0.20	0.10	0.50	0.80	1.90	2.29
3639B1	2.64	2.70	3.90	8.30	8.40	4.60	1.90	0.60	0.30	0.10	0.70	1.00	2.40	2.90
3639C1	2.43	2.50	3.60	7.70	7.80	4.20	1.80	0.50	0.30	0.10	0.60	1.00	2.20	2.68
3639D1	1.93	2.10	2.90	6.20	6.20	3.40	1.40	0.40	0.20	0.10	0.50	0.70	1.80	2.15
3639E1	69.70	57.59	81.43	158.88	198.60	148.95	84.41	44.69	25.82	19.86	15.89	27.80	58.59	76.77
3639F1	2.74	2.80	4.00	8.60	8.70	4.70	2.00	0.60	0.30	0.20	0.70	1.10	2.40	3.00
3639G1	28.70	30.00	43.00	91.00	93.00	50.00	21.00	6.10	3.40	1.60	7.40	11.00	26.00	31.87
3639H1	7.80	8.10	11.00	25.00	25.00	14.00	5.80	1.60	0.90	0.40	2.00	3.10	7.60	8.69
3639Z2	21.49	22.00	31.00	66.00	67.00	36.00	15.00	4.40	2.40	1.20	5.30	8.20	19.00	23.06

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 69.70
SUM OF SUB-DRAINAGE AREAS = 69.82

TOTAL FLOW IN = 922.30
TOTAL FLOW OUT = 922.51

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3639A1	11	72	3.80	4	4.50				
	12	72	11.00	3	7.60				
	1	73	6.20	7	7.80				
	2	73	5.50	3	14.00				
	3	73	11.00	4	23.00				
	4	73	16.00	7	34.00	14	9.40		
	5	73	4.70	4	4.30	30	5.20		
	7	73	0.50	7	0.0				
	8	73	0.0	7	0.0				
	9	73	0.0	9	0.0				
	10	73	0.10	13	0.10				
3639B1	11	72	4.70	5	3.60				
	12	72	14.00	3	9.60				
	1	73	7.60	7	9.80				
	2	73	7.00	3	18.00				
	3	73	14.00	4	29.00				
	4	73	20.00	7	43.00	14	12.00		
	5	73	6.00	4	5.40	30	6.70		
	7	73	0.80	7	1.40				
	8	73	0.10	7	0.0				
	9	73	0.10	9	0.03				
	10	73	0.10	13	0.10				

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TRIBUTARY FLOW INFORMATION FOR NEW YORK 11/26/74

LAKE CODE 3639 CONESUS LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3639C1	11	72	4.70						
	12	72	13.00	3	9.20				
	1	73	7.00	7	9.00				
	2	73	6.40	3	16.00				
	3	73	13.00	4	27.00				
	4	73	18.00	7	40.00	14	11.00		
	5	73	5.50	4	5.00	30	6.20		
	7	73	0.70	7	0.0				
	8	73	0.10	7	0.0				
	9	73	0.0	9	0.0				
	10	73	0.10	13	0.10				
363901	11	72	3.50	5	2.50				
	12	72	10.00	3	7.10				
	1	73	5.80	7	7.30				
	2	73	5.10	3	13.00				
	3	73	10.00	4	21.00				
	4	73	14.00	7	32.00	14	8.70		
	5	73	4.50	4	4.00	30	4.90		
	7	73	0.50	7	1.00				
	8	73	0.10	7	0.04				
	9	73	0.10	9	0.03				
	10	73	0.10	13	0.10				
3639E1	11	72	40.00	5	91.00				
	12	72	350.00	3	250.00				
	1	73	160.00	7	220.00				
	2	73	150.00	3	380.00				
	3	73	280.00	4	590.00				
	4	73	470.00	7	92.00	14	280.00		
	5	73	200.00	4	150.00	30	260.00		
	7	73	59.00	7	87.00				
	8	73	8.00	7	7.00				
	9	73	7.50	9	8.00				
	10	73	2.70	13	1.50				
3639F1	11	72	5.20	5	3.80				
	12	72	14.00	3	10.00				
	1	73	7.90	7	14.00				
	2	73	7.20	3	18.00				
	3	73	15.00	4	30.00				
	4	73	20.00	7	44.00	14	12.00		
	5	73	6.20	4	5.60	30	6.90		
	7	73	0.80	7	1.50				
	8	73	0.10	7	0.0				
	9	73	0.10	9	0.0				
	10	73	0.10	13	0.10				

TRIBUTARY FLOW INFORMATION FOR NEW YORK 11/26/74

LAKE CODE 3639 CONESUS LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
363961	11	72	52.00	5	34.00				
	12	72	150.00	3	109.00				
	1	73	84.00	7	100.00				
	2	73	77.00	3	200.00				
	3	73	160.00	4	320.00				
	4	73	220.00	7	470.00	14	130.00		
	5	73	66.00	4	59.00	30	73.00		
	7	73	8.00	7	15.00				
	8	73	0.60	7	0.70				
	9	73	0.50	9	0.40				
	10	73	1.30	13	0.70				
3639H1	11	72	15.00	5	11.00				
	12	72	46.00	3	30.00				
	1	73	23.00	7	30.00				
	2	73	20.00	3	52.00				
	3	73	43.00	4	86.00				
	4	73	58.00	7	130.00	14	35.00		
	5	73	18.00	4	16.00	30	20.00		
	7	73	2.10	7	4.10				
	8	73	0.20	7	0.0				
	9	73	0.10	9	0.0				
	10	73	0.30	13	0.20				
363922	11	72	39.00						
	12	72	110.00						
	1	73	62.00						
	2	73	55.00						
	3	73	110.00						
	4	73	160.00						
	5	73	47.00						
	7	73	5.80						
	7	73	5.80						
	8	73	0.40						
	9	73	0.40						
	10	73	0.90						

APPENDIX B

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 74/11/26

363901
42 40 00.0 077 50 00.0
CONESUS LAKE
36051 NEW YORK

11EPALES
6

2111202
0030 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/05/27	18 35	0000	19.3	12.0	132	360	8.40	119	0.030	0.020	0.013	0.006
	18 35	0010	16.9	12.0		340	8.50	118	0.060	0.050	0.020	0.013
	18 35	0030	10.0	14.0		360	8.10	119	0.100	0.040	0.061	0.020
72/07/27	12 15	0000			156	340	8.50	110	0.020	0.040	0.013	0.015
	12 15	0004	24.3	8.6		340	8.50	110	0.020	0.040	0.011	0.008
	12 15	0015	23.9	6.2		330	8.40	112	0.160	0.060	0.011	0.008
	12 15	0025	17.0	3.8		340	7.50	117	0.270	0.060	0.014	0.009
	12 15	0032	13.8	3.4		345	7.30	115	0.260	0.060	0.013	0.015
72/10/13	14 30	0000			78	340	8.30	122	0.040	0.150	0.034	0.025
	14 30	0004	14.5	8.1		340	7.95	122	0.020	0.080	0.036	0.029
	14 30	0015	14.5	7.4		340	7.90	121	0.020	0.090	0.036	0.026
	14 30	0025	14.5	7.7		340	7.90	115	0.020	0.080	0.030	0.024
	14 30	0035	14.4	8.0		340	7.90	116	0.020	0.080	0.029	0.022
	14 30	0042	14.4	8.3		340	7.90	117	0.020	0.080	0.028	0.022

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DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/05/27	18 35	0000	5.8J
72/07/27	12 15	0000	10.5J
72/10/13	14 30	0000	3.5J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

363902
42 40 00.0 077 50 00.0
CONESUS LAKE
36051 NEW YORK

11EPALES
6

2111202
0013 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/05/27	20 30	0000	18.9	11.4	156	340	8.40	121	0.050	0.020	0.016	0.008
	20 30	0010	17.0	12.4		320	8.40	120	0.030	0.020	0.020	0.010
72/07/27	12 45	0000			156	325	8.40	115	0.040	0.050	0.011	0.009
	12 45	0004	23.8	9.6		325	8.40	115	0.040	0.040	0.012	0.009
	12 45	0015	23.7	8.4		340	8.40	114	0.040	0.040	0.011	0.008
	12 45	0035	14.0	3.6		360	7.40	113	0.270	0.050	0.010	0.009
	12 45	0046	11.9	3.0		370		118	0.270	0.040	0.011	0.009
72/10/13	14 00	0000			75	345	8.40	114	0.030	0.040	0.023	0.012
	14 00	0004	14.2	8.9		330	8.35	119	0.030	0.040	0.022	0.013
	14 00	0015	14.1	8.6		340	8.30	115	0.030	0.050	0.024	0.013
	14 00	0026	14.0	9.3		330	8.30	115	0.040	0.070	0.029	0.029

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DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/05/27	20 30	0000	7.7J
72/07/27	12 45	0000	5.3J
72/10/13	14 00	0000	26.4J

J VALUE KNOWN TO BE IN ERROR

APPENDIX C

TRIBUTARY DATA

STORET RETRIEVAL DATE 74/11/26

3639A1 LS3639A1
42 47 00.0 077 43 30.0
LONG POINT GULLEY
36 LIVINGSTON CO
T/CONESUS LAKE
ST HWY 256 BRDG
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	11 20		0.310	0.350	0.065	0.050	0.056
72/12/01	09 45		2.100	0.420	0.069	0.052	0.069
73/01/07	15 00		2.000	0.580	0.017	0.027	0.035
73/02/03	09 00		2.400	1.150	0.060	0.041	0.080
73/03/04	16 00		2.140	0.960	0.096	0.054	0.150
73/04/07	12 30		1.840	0.270	0.017	0.026	0.045
73/04/14	16 15		1.160	2.800	0.081	0.014	0.025
73/05/04	14 00		0.490	0.900	0.084	0.060	0.095
73/05/30	17 00		0.430	0.840	0.025	0.026	0.065

STORET RETRIEVAL DATE 74/11/26

363981 LS363981
42 46 30.0 077 42 30.0
NORTH GULLEY CREEK
36 LIVINGSTON CO
T/CONESUS LAKE
BRDG IN ST MARGARETS CHAPEL
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10 40		0.640	0.400	0.005K	0.032	0.039
72/12/03	11 00		1.160	0.630	0.097	0.060	0.084
73/01/07	14 00		1.140		0.035	0.027	
73/02/03	10 30		1.260	0.700	0.058	0.036	0.075
73/03/04	15 00		1.400	0.720	0.100	0.048	0.160
73/04/07	14 05		1.220	0.400	0.048	0.032	0.070
73/04/14	15 30		0.790	0.950	0.033	0.014	0.030
73/05/04	13 15		0.160	1.300	0.035	0.008	0.020
73/05/30	18 30		0.540	0.420	0.006	0.020	0.030
73/07/07	12 30		0.052	2.310	0.080	0.005K	0.005K
73/09/09	10 20		0.062	1.260	0.072	0.011	0.035
73/10/13	14 45		0.010K	0.710	0.009		0.005

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3639C1 LS3639C1
42 47 30.0 077 42 30.0
DENSHORE GULLEY
36 LIVINGSTON CO
T/CONESUS LAKE
BRDG NEAR MCPHERSONS COVE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/01/07	14	30	1.380	0.360	0.005K	0.010	0.019
73/02/03	10	15	1.560	0.790	0.027	0.019	0.045
73/03/04	15	15	1.700	0.580	0.058	0.032	0.085
73/04/07	13	50	1.460	0.630	0.064	0.044	0.085
73/04/14	16	00	0.090	1.980	0.069	0.006	0.025
73/05/04	13	00	0.154	1.470	0.031	0.011	0.025
73/05/30	18	15	0.078	0.560	0.013	0.006	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

363901 LS363901
42 49 30.0 077 41 30.0
WILKINS CREEK
36 LIVINGSTON CO
T/CONESUS LAKE
BRDG 1.5 MI W OF LIVONIA BELO STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10 20		0.910	0.450	0.020	0.280	0.325
73/01/07	13 20		1.320	0.420	0.017	0.060	0.090
73/02/03	09 45		1.340	0.350	0.031	0.052	0.075
73/03/04	14 45		1.500	0.600	0.063	0.042	0.120
73/04/07	13 35		1.280	0.690	0.042	0.038	0.120
73/04/14	15 00		0.910	2.300	0.060	0.026	0.045
73/05/04	12 45		0.273	1.380	0.035	0.037	0.060
73/05/30	18 00		0.450	0.560	0.019	0.063	0.105
73/07/07	12 00		0.022	0.800	0.027	0.290	0.315
73/08/07	20 30		0.025	0.810	0.046	0.378	0.450
73/09/09	09 40		0.022	1.320	0.060	0.450	0.520
73/10/13	14 15		0.010K	0.600	0.012	0.317	0.365

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

363902 LS363902
42 49 30.0 077 40 30.0
WILKINS CREEK
36 LIVINGSTON CO
T/CONESUS LAKE
BRDG .25 MI W OF LIVONIA ABOV STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10 05		0.720	0.350	0.006	0.046	0.088
73/01/07	13 40		1.520	0.260	0.063	0.035	0.063
73/02/03			1.320	0.600	0.028	0.040	0.070
73/03/04	14 30		1.400	0.360	0.040	0.058	0.145
73/04/07	13 20		1.460	0.840	0.120	0.060	
73/04/14	14 45		1.480		0.072	0.046	0.060
73/05/04	12 30		1.200	0.780	0.056	0.054	0.075
73/05/30	17 45		1.020	0.420	0.016	0.046	0.110
73/07/07	11 50		0.610	0.290	0.037	0.042	0.075
73/08/07	20 15		0.840	0.340	0.035	0.032	0.040
73/09/09	09 20		0.570		0.126	0.044	0.055
73/10/13	14 00		0.120	1.430	0.068	0.177	

STORET RETRIEVAL DATE 74/11/26

3639E1 LS3639E1
42 50 00.0 077 42 30.0
CONESUS CREEK
36 LIVINGSTON CO
0/CONESUS LAKE
ST HWY BRDG IN LAKEVILLE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	09 30		0.140	0.500	0.005K	0.006	0.026
72/12/03	10 00		0.220	0.460	0.022	0.008	0.026
73/01/07	13 30		0.097	0.400	0.026	0.005	0.019
73/02/03	09 00		0.360	0.800	0.080	0.022	0.040
73/03/04	14 15		0.640	0.785	0.170	0.042	0.075
73/04/07	13 05		0.168	0.460	0.036	0.005K	0.020
73/04/14	14 30		0.154	0.960	0.063	0.005K	0.025
73/05/04	12 15		0.140	0.910	0.040	0.008	0.030
73/05/30	17 30		0.110	1.400	0.050	0.010	0.025
73/07/07	11 40		0.031	1.320	0.052	0.006	0.015
73/08/07	20 00		0.054	0.600	0.019	0.015	0.015
73/09/09	09 00		0.027	2.300	0.072	0.008	0.035
73/10/13	13 45		0.010K	1.050	0.046	0.015	0.055

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3639F1 LS3639F1
42 50 00.0 077 42 30.0
HANNAS CREEK
36 LIVINGSTON CO
T/CONESUS LAKE
BRDG IN PEBBLE BEACH
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	09 45		3.400	0.650	0.027	0.079	0.105
72/12/03	10 00		0.430	0.810	0.066	0.066	0.105
73/01/07	15 20		1.000	0.580	0.014	0.020	0.038
73/02/03	09 15		1.760	1.890	0.294	0.105	0.170
73/03/04	14 00		1.720	1.320	0.318	0.099	0.190
73/04/07	12 45		1.060	0.705	0.105	0.060	0.100
73/04/14	14 15		0.420	2.000	0.069	0.013	0.030
73/05/04	12 00		0.490	1.800	0.044	0.038	0.060
73/05/30	17 15		0.660	0.800	0.013	0.068	0.100
73/07/07	11 30		0.084	2.900	0.072	0.032	0.080

STORET RETRIEVAL DATE 74/11/26

3639G1 LS3639G1
42 43 30.0 077 43 00.0
CONESUS INLET
36 LIVINGSTON CO
I/CONESUS LAKE
BRDG ON RD BETWEEN ST HWY 45 & E SWAMP R
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11 10		0.117	0.500	0.005K	0.019	0.038
73/01/07	15 00		0.168	0.350	0.072	0.007	0.017
73/02/03			0.220	0.240	0.030	0.008	0.035
73/03/04	15 45		0.539	0.480	0.120	0.029	0.070
73/04/07	14 30		0.400	0.460	0.069	0.017	0.040
73/04/14	15 15		1.040	1.050	0.056	0.006	0.020
73/05/04	13 45		0.042	2.100	0.050	0.019	0.035
73/05/30	19 20		0.052	1.050	0.013	0.029	0.055
73/07/07			0.027	3.300	0.115	0.050	0.135
73/08/07	21 45		0.018	1.470	0.022	0.031	0.165
73/09/09	11 00		0.110	2.520	0.580	0.040	0.315
73/10/13	15 15		0.017	3.000	0.084	0.023	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3639M1 LS3639M1
42 43 00.0 077 42 30.0
DAVIS CREEK
36 LIVINGSTON CO
I/CONESUS LAKE
BRDG ON RD W OFF ST HWY 8
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11 00		0.210	0.250	0.005K	0.006	0.009
72/12/03	11 00		0.357	0.150	0.023	0.006	0.012
73/01/07	14 00		0.450	0.130	0.005K	0.005K	0.010
73/02/03			0.480	0.210	0.023	0.007	0.030
73/03/04	15 30		0.600	0.500	0.056	0.016	0.085
73/04/07	14 15		0.580	0.290	0.033	0.011	0.020
73/04/14	15 45		0.378	1.600	0.072	0.005K	0.020
73/05/04	13 30		0.066	1.980	0.054	0.005K	0.010
73/05/30	18 45		0.048	1.890	0.025	0.005K	0.005K
73/07/07	12 45		0.273	1.050	0.046	0.013	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED